```
=> d hist

     (FILE 'HOME' ENTERED AT 11:18:19 ON 17 MAR 2005)

     FILE 'REGISTRY' ENTERED AT 11:18:56 ON 17 MAR 2005
L1              0 S 0.45-0.55/LI AND 1/MN AND 0.05-0.15/BI AND 2.075-2.225/O
L2              0 S .5/LI AND 1/MN AND .12/BI AND 2.18/O
~~L3            453 S 2/MN AND 1/LI AND 4/O~~
~~L4              0 S 1.98-2,05/MN AND 0-1.5/LI AND 3.8-4.2/O~~  testing-if working
~~L5            780 S 1.98-2.05/MN AND 0-1.5/LI AND 3.8-4.2/O~~

     FILE 'CAPLUS' ENTERED AT 11:25:52 ON 17 MAR 2005
L6            968 S (MANGANESE OR MN) (3A) OXIDE# (5A) (BISMUTH OR BI)
L7             72 S L6 (P) (LITHIUM OR LI)

=> s l7 and (cathode or positive or cathodic)
        164223 CATHODE
         74992 POSITIVE
         58776 CATHODIC
L8            19 L7 AND (CATHODE OR POSITIVE OR CATHODIC)

=> d hist

     (FILE 'HOME' ENTERED AT 11:18:19 ON 17 MAR 2005)

     FILE 'REGISTRY' ENTERED AT 11:18:56 ON 17 MAR 2005
L1              0 S 0.45-0.55/LI AND 1/MN AND 0.05-0.15/BI AND 2.075-2.225/O
L2              0 S .5/LI AND 1/MN AND .12/BI AND 2.18/O
L3            453 S 2/MN AND 1/LI AND 4/O
L4              0 S 1.98-2,05/MN AND 0-1.5/LI AND 3.8-4.2/O
L5            780 S 1.98-2.05/MN AND 0-1.5/LI AND 3.8-4.2/O

     FILE 'CAPLUS' ENTERED AT 11:25:52 ON 17 MAR 2005
L6            968 S (MANGANESE OR MN) (3A) OXIDE# (5A) (BISMUTH OR BI)
L7             72 S L6 (P) (LITHIUM OR LI)
L8             19 S L7 AND (CATHODE OR POSITIVE OR CATHODIC)

=> d ibib ab it 1-
YOU HAVE REQUESTED DATA FROM 19 ANSWERS - CONTINUE? Y/(N):y
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L8 ANSWER 1 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:1130221 CAPLUS
DOCUMENT NUMBER: 142:180287
TITLE: Improved cycling performance of **bismuth**-modified amorphous **manganese oxides** as cathodes for rechargeable **lithium** batteries
AUTHOR(S): Yang, Jingsi; Atwater, Terrill B.; Xu, Jun John
CORPORATE SOURCE: Department of Ceramic and Materials Engineering, Rutgers, State University of New Jersey, Piscataway, NJ, 08854, USA
SOURCE: Journal of Power Sources (2005) 139(1-2), 274-278
CODEN: JPSODZ; ISSN: 0378-7753
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB **Bismuth**-modified amorphous **manganese oxides** were synthesized via a room temperature aqueous route. The oxides were galvanostatically tested as intercalation cathodes for rechargeable **lithium** batteries at 1 mA/cm2 between 1.5 and 4.3 V. In sharp contrast to severe capacity fading of unmodified amorphous manganese oxide synthesized by the same route, a stable cycling performance of the **bismuth**-modified amorphous **manganese oxide** was observed After an initial drop from 185 to 145 mA-h/g in around 10 cycles, the capacity of the **bismuth**-modified amorphous **manganese oxide** remains essentially unchanged for another 40 cycles. Based on results from x-ray diffraction and cyclic voltammetry characterization, it is suggested that an electrochem. active and stable local structure evolves inside the **bismuth**-modified amorphous **manganese oxide** upon initial cycling, leading to the stabilized cycling performance for subsequent cycles.

IT Battery cathodes
(synthesis and cycling performance of bismuth-modified amorphous manganese dioxide as **cathode** for rechargeable lithium batteries)

IT 1313-13-9, Manganese dioxide, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical,

engineering or chemical process); PROC (Process); USES (Uses)
(synthesis and cycling performance of bismuth-modified amorphous manganese dioxide as **cathode** for rechargeable lithium batteries)

IT 7440-69-9, Bismuth, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(synthesis and cycling performance of bismuth-modified amorphous manganese dioxide as **cathode** for rechargeable lithium batteries)

REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 2 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:569197 CAPLUS
DOCUMENT NUMBER: 141:126282
TITLE: **Cathode** for secondary battery, the battery, and manufacture of the **cathode**
INVENTOR(S): Kawasaki, Daisuke; Kumeuchi, Tomokazu; Numata, Tatsuji
PATENT ASSIGNEE(S): NEC Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004199909	A2	20040715	JP 2002-364409	20021216
PRIORITY APPLN. INFO.:			JP 2002-364409	20021216

AB The **cathode** contains **Li Bi oxide** and **Li Mn oxide**. Preferably, the **Li** Bi oxide has peaks near 2θ =20, 26.5, and 30° on its Cu Kα x ray diffraction pattern. The **cathode** is prepared by mixing the **Li Bi oxide**, and **Li**

Mn oxide with a binder and applying the mixture on a
collector; and the Li Bi oxide is prepared by firing a mixture of a
Li compound and a Bi compound in an O containing atmospheric at 350-750°.
IT Battery cathodes
(cathodes containing **lithium manganese oxide**
and **lithium bismuth** oxide and their manufacture for
secondary **lithium** batteries)
IT 176979-24-1, **Lithium** manganese oxide ($Li_{1.12}Mn_{1.88}O_4$)
RL: DEV (Device component use); USES (Uses)
(cathodes containing **lithium manganese oxide**
and **lithium bismuth** oxide and their manufacture for
secondary **lithium** batteries)
IT 11086-13-8P, Bismuth **lithium** oxide ($BiLiO_2$) 12421-80-6P,
Bismuth **lithium** oxide ($BiLi_7O_6$) 12514-00-0P, Bismuth
lithium oxide ($BiLi_5O_5$) 130280-71-6P, **Bismuth**
lithium oxide 167994-88-9P, Bismuth **lithium**
oxide ($BiLi_3O_4$)
RL: DEV (Device component use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(cathodes containing **lithium manganese oxide**
and **lithium bismuth** oxide and their manufacture for
secondary **lithium** batteries)

L8 ANSWER 3 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	2004:370362 CAPLUS
DOCUMENT NUMBER:	141:192943
TITLE:	Development of secondary Li-MnO2 coin cell
AUTHOR(S):	Liu, Jin-cheng; Liang, Xin-bo; Zhou, Zhen-tao
CORPORATE SOURCE:	Material Science and Engineering Institute, South China University of Technology, Guangzhou Guangdong, 510640, Peop. Rep. China
SOURCE:	Dianyuan Jishu (2004), 28(3), 153-155 CODEN: DIJIFT; ISSN: 1002-087X
PUBLISHER:	Dianyuan Jishu Bianjibu
DOCUMENT TYPE:	Journal
LANGUAGE:	Chinese

AB **Bi**-modified **Li**-containing **manganese oxide** was synthesized as **cathode** active material, and the ML 621, 3 V type rechargeable coin batteries were fabricated with selected electrolyte and **Li** alloy anode. The results show that the batteries have excellent electrochem. characteristics of stable discharge voltage, low internal resistance, and good recharge ability and are suitable as the power source of the memory back-up devices.

IT Secondary batteries
(button-type; development of lithium-manganese dioxide coin secondary batteries)

L8 ANSWER 4 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:81124 CAPLUS
DOCUMENT NUMBER: 138:356140
TITLE: **Bismuth**-doped **lithium** **manganese oxide** rechargeable cells
AUTHOR(S): Suszko, Arek; Atwater, Terrill
CORPORATE SOURCE: Research Development and Engineering Center, U.S. Army CECOM, Ft. Monmouth, NJ, USA
SOURCE: Proceedings of the Power Sources Conference (2002), 40th, 328-330
CODEN: PPOCFD
PUBLISHER: National Technical Information Service
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A **cathode** material containing heat-treated electrolytic manganese dioxide doped with lithium and bismuth compds. is evaluated for rechargeable lithium and lithium-ion batteries. The final product consists of low crystalline Li_xMnO_2 compds., Bi_2O_3, and in some cases Mn_2O_3.

Coupling the Li_xMnO_2 phases with $MnO_2 \cdot Bi_2O_3$, will produce a high-rate **cathode** material. The $MnO_2 \cdot Bi_2O_3$ couple is rechargeable. The addition of a lithium compound into the mixture will increase the specific capacity of the material. Long heat treatments produced materials that exhibited an initial capacity of 160 mAh/g (of active material) and 120 mAh/g after 10 cycles (at 1 mA/cm^2). Shorter heat treatments produced materials that exhibited initial capacities of 130 mAh/g and decayed to 110 mAh/g after 10 cycles (at 1 mA/cm^2). This material exhibits excellent charging capability. However, its capacity during discharge slowly fades. A button cell charged at 3 mA/cm^2 and discharged at 0.5 mA/cm^2 showed an initial specific discharge capacity of 175 mAh/g, but decayed to 123 mAh/g after 10 cycles.

```
IT   Battery cathodes
        (bismuth-doped lithium manganese
        oxide rechargeable cells)
IT   7440-69-9, Bismuth, uses
     RL: CPS (Chemical process); MOA (Modifier or additive use); PEP
(Physical,
     engineering or chemical process); PROC (Process); USES (Uses)
        (bismuth-doped lithium manganese
        oxide rechargeable cells)
IT   320425-33-0P, Bismuth lithium manganese
     oxide
     RL: CPS (Chemical process); PEP (Physical, engineering or chemical
     process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
        (bismuth-doped lithium manganese
        oxide rechargeable cells)
REFERENCE COUNT:          2      THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS
                                 RECORD. ALL CITATIONS AVAILABLE IN THE RE
FORMAT

L8   ANSWER 5 OF 19  CAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2002:676351  CAPLUS
DOCUMENT NUMBER:          137:203990
TITLE:                    Secondary battery
INVENTOR(S):              Watanabe, Mikio; Numata, Tatsuji; Kumeuchi, Tomokazu
PATENT ASSIGNEE(S):       NEC Corporation, Japan
SOURCE:                   PCT Int. Appl., 21 pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE          APPLICATION NO.       DATE
     ---------------     ----   --------      --------------------  --------
     WO 2002069417        A1    20020906      WO 2002-JP1329        20020215
         W:  CN, KR, US
         RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,
             PT, SE, TR
     JP 2002260632        A2    20020913      JP 2001-52289          20010227
     EP 1383183           A1    20040121      EP 2002-744912         20020215
```

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, FI, CY, TR

US 2004072071	A1	20040415	US 2003-469119		20030827
PRIORITY APPLN. INFO.:			JP 2001-52289	A	20010227
			WO 2002-JP1329	W	20020215

AB The battery uses a Li Mn oxide-Li Ni oxide mixture **cathode** containing an element selected from Bi, Pb, Sb, and Sn. Preferably, the Mn oxide is Li1.02-1.25 Mn2O4; the Ni oxide is LiNi1-xMxO2, where M = Co, Mn, Fe, Al, and/or Sr and $0<x \leq 0.5$; and the element is added as carbonate, hydroxide, or oxide.

IT Battery cathodes
(lithium manganese oxide-lithium nickel oxide mixture cathodes containing
metal additives for secondary lithium batteries)

IT 10361-43-0, **Bismuth** hydroxide 130242-31-8, Lithium manganese oxide (Li1.05Mn2O4) 260360-09-6, Lithium manganese oxide
$Li_{0.45-0.55}$ (Li1.02-1.25Mn2O4) 320425-33-0, **Bismuth lithium manganese oxide**
RL: DEV (Device component use); USES (Uses)
(**lithium manganese oxide-lithium** nickel **oxide** mixture cathodes containing metal additives for secondary **lithium** batteries)

IT 113066-89-0, Cobalt lithium nickel oxide (Co0.2LiNi0.8O2)
RL: DEV (Device component use); USES (Uses)
(lithium nickel oxide-lithium manganese oxide- mixture cathodes containing
metal additives for secondary lithium batteries)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 6 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	2002:632061 CAPLUS
DOCUMENT NUMBER:	138:92695
TITLE:	Modified host lattices for Li intercalation with improved electrochemical properties
AUTHOR(S):	Pereira-Ramos, J. P.; Bach, S.; Franger, S.; Soudan,

P.; Baffier, N.
CORPORATE SOURCE: Laboratoire d'Electrochimie, Catalyse et Synthese Organique, C.N.R.S., UMR 7582, Thiais, 94320, Fr.

SOURCE: NATO Science Series, II: Mathematics, Physics and Chemistry (2002), 61(New Trends in Intercalation Compounds for Energy Storage), 269-288
CODEN: NSSICD
PUBLISHER: Kluwer Academic Publishers
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Transition metal oxides, such as vanadium and manganese oxides, are the most studied Li intercalation hosts for the **cathode** application of rechargeable batteries. The electrochem. performance of these oxides can be increased through a combination of low temperature techniques. Incorporation of metallic cations into the host structure and substitution reactions proved to be successful in strengthening the oxide structure and improving the capacity and the cycle life of the **cathode**.

IT Secondary batteries
(lithium; modified V205 and MnO2 host lattices for Li intercalation with improved electrochem. properties for battery cathodes)

IT Battery cathodes
Electric impedance
Intercalation
(modified V205 and MnO2 host lattices for Li intercalation with improved electrochem. properties for battery cathodes)

IT Intercalation compounds
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(modified V205 and MnO2 host lattices for Li intercalation with improved electrochem. properties for battery cathodes)

IT 1313-13-9P, Manganese dioxide, uses 1314-62-1P, Vanadium pentoxide, uses
130242-32-9P, Lithium manganese oxide (Li0.9Mn2O4) 163932-04-5P, **Bismuth manganese oxide** Bi0.1MnO2.11
164144-54-1P, **Bismuth manganese oxide** Bi0.15MnO2.16 164144-56-3P, **Bismuth manganese oxide** Bi0.27MnO2.34 203200-29-7P, Chromium vanadium oxide Cr0.11V205.16 265652-09-3P, Manganese vanadium oxide Mn0.16V205.16

Bi .1 Mn O 2.11

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     265652-10-6P, Gallium vanadium oxide Ga0.11V205.16   265652-11-7P,
     Magnesium vanadium oxide Mg0.16V205.16   265652-12-8P, Nickel vanadium
     oxide Ni0.16V205.16   265652-13-9P, Aluminum vanadium oxide Al0.11V205.16
     301543-05-5P, Cobalt lithium manganese oxide Co0.15Li0.45Mn0.8502
     476300-79-5P, Lithium manganese oxide Li0.1MnO1.84   476300-85-3P, Cobalt
     manganese oxide Co0.15Mn0.8501.84   476300-87-5P, Cobalt lithium
manganese
     oxide Co0.15Li0.1Mn0.8501.84   483292-74-6P, Chromium lithium vanadium
     oxide (Cr0.11Li1.5V205.16)   483292-75-7P, Iron lithium manganese oxide
     (Fe0.12Li0.44Mn0.8802.1)   483292-76-8P, Lithium manganese nickel oxide
     (Li0.45Mn0.84Ni0.1602.05)   483292-78-0P, Copper lithium manganese oxide
     (Cu0.21Li0.45Mn0.7902.09)
     RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or
     engineered material use); PREP (Preparation); USES (Uses)
        (modified V205 and MnO2 host lattices for Li intercalation
        with improved electrochem. properties for battery cathodes)
REFERENCE COUNT:         28    THERE ARE 28 CITED REFERENCES AVAILABLE FOR
THIS
                               RECORD. ALL CITATIONS AVAILABLE IN THE RE
FORMAT

L8   ANSWER 7 OF 19  CAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:        2002:502759  CAPLUS
DOCUMENT NUMBER:         137:35580
TITLE:                   Lithium manganese oxide secondary battery
INVENTOR(S):             Kasai, Masahiro; Douzono, Toshinori
PATENT ASSIGNEE(S):      Hitachi, Ltd., Japan
SOURCE:                  U.S., 6 pp.
                         CODEN: USXXAM
DOCUMENT TYPE:           Patent
LANGUAGE:                English
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE          APPLICATION NO.        DATE
     ---------------     ----   --------      --------------------   --------
     US 6413673           B1    20020702      US 2000-609375         20000703
PRIORITY APPLN. INFO.:                        US 2000-609375         20000703

AB   In order to provide a high performance secondary battery, which is
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Between 0.45-0.55

suitable for applying to portable apparatus or elec. vehicles, a spinel type
oxide Li1+xMn2-x04 (0<x<0.33) added with at least an element different
from the composing element is used as an active material.

IT Electric appliances
(household; lithium manganese oxide secondary battery)

IT Battery cathodes
Electric vehicles
(lithium manganese oxide secondary battery)

IT Secondary batteries
(lithium; lithium manganese oxide secondary battery)

IT Computers
(microcomputers; lithium manganese oxide secondary battery)

IT Information systems
(portable apparatus; lithium manganese oxide secondary battery)

IT Video cameras
(portable; lithium manganese oxide secondary battery)

IT Power
(storage system; lithium manganese oxide secondary battery)

IT 176087-62-0, Lithium manganese oxide Li1-1.33Mn1.67-204 437712-61-3, Lithium manganese borate oxide (Li1-1.33Mn1.67-2(B02)0-200-4) 437712-62-4, Lithium manganese metaphosphite oxide (Li1-1.33Mn1.67-2(P02)0-200-4) 437712-63-5, Lithium magnesium manganese oxide (Li1-1.33Mg0-2Mn1.67-204) 437712-64-6, Lithium manganese arsenenite oxide (Li1-1.33Mn1.67-2(As02)0-200-4) 437712-65-7, Antimony lithium manganese oxide (Sb0-2Li1-1.33Mn1.67-204) 437712-66-8, Lithium manganese zirconium oxide (Li1-1.33Mn1.67-2Zr0-204) 437712-67-9, Lithium manganese sodium oxide (Li1-1.33Mn1.67-2Na0-204) 437712-68-0, Beryllium lithium manganese oxide (Be0-2Li1-1.33Mn1.67-204) 437712-69-1, Lithium manganese yttrium oxide (Li1-1.33Mn1.67-2Y0-204) 437712-70-4, Lithium manganese silicon oxide (Li1-1.33Mn1.67-2Si0-204) 437712-71-5, Aluminum lithium manganese oxide (Al0-2Li1-1.33Mn1.67-204) 437712-72-6, Lithium manganese carbide oxide (Li1-1.33Mn1.67-2C0-204) 437712-73-7, Lithium manganese fluoride oxide (Li1-1.33Mn1.67-2F0-204) 437712-74-8, **Bismuth lithium manganese oxide** (Bi0-2Li1-1.33Mn1.67-

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     204)   437712-75-9, Lead lithium manganese oxide
(PbO-2Li1-1.33Mn1.67-204)
     437712-76-0, Germanium lithium manganese oxide (GeO-2Li1-1.33Mn1.67-204)
     437712-77-1, Lithium manganese tin oxide (Li1-1.33Mn1.67-2SnO-204)
     RL: DEV (Device component use); USES (Uses)
        (lithium manganese oxide secondary battery)
IT   61179-01-9, Aluminum lithium manganese oxide   138758-08-4, Lithium
     manganese Phosphorus oxide   152325-75-2, Lead lithium manganese oxide
     153327-01-6, Germanium lithium manganese oxide   153327-02-7, Boron
     lithium manganese oxide   153327-05-0, Lithium manganese Tin oxide
     153327-06-1, Antimony lithium manganese oxide   153385-76-3, Arsenic
     lithium manganese oxide   173525-03-6, Lithium manganese Sodium oxide
     175786-46-6, Lithium Magnesium manganese oxide   201534-12-5, Lithium
     manganese Zirconium oxide   208394-06-3, Carbon lithium manganese oxide
     252568-44-8, Lithium manganese Silicon oxide   267009-74-5, Lithium
     manganese fluoride oxide   320425-33-0, Bismuth lithium
     manganese oxide   374079-64-8, Lithium manganese Yttrium
     oxide   393802-01-2, Beryllium lithium manganese oxide
     RL: MOA (Modifier or additive use); USES (Uses)
        (lithium manganese oxide secondary
        battery)
REFERENCE COUNT:         6     THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS
                               RECORD. ALL CITATIONS AVAILABLE IN THE RE
FORMAT

L8   ANSWER 8 OF 19  CAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:        2002:104869  CAPLUS
DOCUMENT NUMBER:         136:153886
TITLE:                   Lithium manganate-type cathode active mass
                         and secondary lithium battery using it
INVENTOR(S):             Shiosaki, Ryuji; Fujii, Akihiro; Okabe, Kazuya; Yufu,
                         Hiroshi
PATENT ASSIGNEE(S):      Yuasa Corporation, Japan
SOURCE:                  Jpn. Kokai Tokkyo Koho, 10 pp.
                         CODEN: JKXXAF
DOCUMENT TYPE:           Patent
LANGUAGE:                Japanese
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:
```

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002042812	A2	20020208	JP 2000-227758	20000727
PRIORITY APPLN. INFO.:			JP 2000-227758	20000727

AB The **cathode** active mass contains Li Mn mixed oxide Li1+x[Mn(2-x-y)My]O4 containing B by satisfying Mn(2-x-y)My:B = 2:0.01-0.1 (where x = 0-0.3; y = 0-0.2; M = Be, C, Si, P, Sc, Cu, Zn, Ga, Ge, As, Se, Sr, Mo, Pd, Ag, Cd, In, Sn, Sb, Te, Ba, Ta, W, Pb, Bi, Co, Fe, Cr, Ni, Ti, Zr, Nb, Y, Al, Na, K, Mg, Ca, Cs, La, Ce, Nd, Sm, Eu, and/or Tb). The secondary lithium battery is equipped with a **cathode** containing the active mass, a Li-intercalating anode, and an electrolyte solution containing a F-containing salt. The battery has good storage stability.

IT Battery cathodes
(lithium manganate-type **cathode** active mass containing boron for secondary battery)

IT Secondary batteries
(lithium; lithium manganate-type **cathode** active mass containing boron for secondary battery)

IT 21324-40-3, Lithium hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(electrolyte; lithium manganate-type **cathode** active mass containing boron for secondary battery)

IT 53027-29-5, Iron Lithium Manganese oxide 138758-08-4, Lithium Manganese phosphorus oxide 152325-75-2, Lead Lithium Manganese oxide 153327-00-5, Gallium Lithium Manganese oxide 153327-01-6, Germanium Lithium Manganese oxide 153327-04-9, Indium Lithium Manganese oxide 153327-05-0, Lithium Manganese Tin oxide 153327-06-1, Antimony Lithium Manganese oxide 153385-76-3, Arsenic Lithium Manganese oxide 153385-77-4, Lithium Manganese tellurium oxide 162684-16-4, Lithium Manganese Nickel oxide 173390-83-5, Lithium manganese oxide (Li1.08Mn1.92O4) 173525-03-6, Lithium Manganese Sodium oxide 175786-46-6, Lithium Magnesium Manganese oxide 187156-09-8, Lithium Manganese Zinc oxide 191538-04-2, Copper Lithium Manganese oxide 201534-12-5, Lithium Manganese Zirconium oxide 204450-96-4, Chromium Lithium Manganese oxide 208394-04-1, Lithium Manganese Titanium oxide

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      208394-05-2, Lithium Manganese Molybdenum oxide   208394-06-3, Carbon
      Lithium Manganese oxide   245085-55-6, Calcium Lithium Manganese oxide
      245085-56-7, Lithium Manganese Terbium oxide   252568-43-7, Lithium
      Manganese Tungsten oxide   252568-44-8, Lithium Manganese silicon oxide
      273725-34-1, Lithium Manganese Potassium oxide   305365-08-6, Aluminum
      lithium manganese oxide (Al0.05Li1.08Mn1.87O4)   320425-32-9, Cerium
      Lithium Manganese oxide   320425-33-0, Bismuth Lithium
      Manganese oxide (   357308-23-7, Barium Lithium
      Manganese oxide   374079-61-5, Lithium Manganese Scandium oxide
      374079-62-6, Lithium Manganese Strontium oxide   374079-63-7, Lanthanum
      Lithium Manganese oxide   374079-64-8, Lithium Manganese Yttrium oxide
      393802-01-2, Beryllium lithium manganese oxide   393802-02-3, Lithium
      manganese selenium oxide   393802-03-4, Lithium manganese palladium oxide
      393802-04-5, Lithium manganese silver oxide   393802-05-6, Cadmium
lithium
      manganese oxide   393802-06-7, Lithium manganese tantalum oxide
      393802-07-8, Lithium manganese niobium oxide   393802-08-9, Cesium
lithium
      manganese oxide   393802-09-0, Lithium manganese neodymium oxide
      393802-10-3, Lithium manganese samarium oxide   393802-11-4, Europium
      lithium manganese oxide
      RL: DEV (Device component use); USES (Uses)
         (lithium manganate-type cathode active mass containing
         boron for secondary battery)
IT    7440-42-8, Boron, uses
      RL: DEV (Device component use); MOA (Modifier or additive use); USES
      (Uses)
         (microalloying element; lithium manganate-type cathode active
         mass containing boron for secondary battery)

L8   ANSWER 9 OF 19  CAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:        2001:859532  CAPLUS
DOCUMENT NUMBER:         136:265657
TITLE:                   A rapid evaluation of vanadium oxide and manganese
                         oxide as battery materials with a micro-
                         electrochemistry technique
AUTHOR(S):               Vivier, V.; Belair, S.; Cachet-Vivier, C.; Nedelec,
                         J.-Y.; Yu, L. T.
CORPORATE SOURCE:        Catalyse et Synthese Organique, Laboratoire
                         d'Electrochimie, UMR 7582 CNRS, Universite Paris Val
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de Marne, Thiais, 94320, Fr.
SOURCE: Journal of Power Sources (2001), 103(1), 61-66
CODEN: JPSODZ; ISSN: 0378-7753
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The electrochem. behavior of vanadium oxide V205 and **bismuth** doped **manganese oxide Bi**-MnO2 as battery materials was studied with a cavity microelectrode (CME). This technique, which allows working on a very few amount of material, appears to be suitable when high scan rates are used. Thus, it is possible to perform many hundreds cycles in a short time. The performances of pure vanadium oxide as **lithium** insertion material in inorg. media, examined with a CME appear to be excellent whereas poor results were obtained with Bi doped MnO2, for which the electrochem. mechanism proceeds via dissoln.

IT Battery cathodes
(rapid evaluation of vanadium oxide and manganese oxide as battery materials with a micro-electrochem. technique)

IT 1314-62-1, Vanadia, processes 136479-02-2, Bismuth manganese oxide
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(rapid evaluation of vanadium oxide and manganese oxide as battery materials with a micro-electrochem. technique)

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 10 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:598428 CAPLUS
DOCUMENT NUMBER: 135:155272
TITLE: Production of **cathode** electroactive material for nonaqueous lithium ion secondary battery
INVENTOR(S): Shirakawa, Akihiko; Noda, Takao
PATENT ASSIGNEE(S): Showa Denko Kabushiki Kaisha, Japan
SOURCE: U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

```
     PATENT NO.          KIND   DATE          APPLICATION NO.          DATE
     ---------------     ----   --------      --------------------     --------
     US 2001014421        A1    20010816      US 2001-765349           20010122
     US 6673491           B2    20040106
     JP 2001273900        A2    20011005      JP 2001-13642            20010122
PRIORITY APPLN. INFO.:                        JP 2000-17811         A  20000121

                                              US 2000-214424P       P  20000628
```

AB The present invention provides a **cathode** electroactive material comprising a composite oxide comprising β-MnO_2 and a spinel oxide predominantly comprising lithium, manganese, and oxygen. The present invention provides a process for producing the material, which process comprises acid treatment of a composite oxide comprising a spinel oxide predominantly comprising lithium, manganese, and oxygen, and heat treatment of the resultant composite oxide at a temperature of about 200° or higher and lower than about 400°. The thus-produced oxide is employed as a **cathode** electroactive material in a nonaq. secondary cell.

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; production of **cathode** electroactive material for nonaq. lithium ion secondary battery)

IT Secondary batteries
(lithium; production of **cathode** electroactive material for nonaq. lithium ion secondary battery)

IT Battery cathodes
Heat treatment
(production of **cathode** electroactive material for nonaq. lithium ion secondary battery)

IT Carbon black, uses
RL: MOA (Modifier or additive use); USES (Uses)
(production of **cathode** electroactive material for nonaq. lithium ion secondary battery)

IT Synthetic fibers
RL: MOA (Modifier or additive use); USES (Uses)
(silica; production of **cathode** electroactive material for nonaq. lithium ion secondary battery)

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IT   9002-84-0, Ptfe
     RL: TEM (Technical or engineered material use); USES (Uses)
        (binder; production of cathode electroactive material for nonaq.
        lithium ion secondary battery)
IT   108-32-7, Propylene carbonate   616-38-6, Dimethyl carbonate   1313-13-9,
     Manganese dioxide, uses   9003-07-0, Polypropylene   21324-40-3, Lithium
     hexafluorophosphate
     RL: DEV (Device component use); USES (Uses)
        (production of cathode electroactive material for nonaq. lithium
        ion secondary battery)
IT   12057-17-9P, lithium manganese oxide limn2o4   320425-33-0P,
     Bismuth lithium manganese oxide
     RL: DEV (Device component use); SPN (Synthetic preparation); PREP
     (Preparation); USES (Uses)
        (production of cathode electroactive material for nonaq.
        lithium ion secondary battery)
IT   554-13-2, Lithium carbonate   17375-37-0, Manganese carbonate
     21645-51-2, Aluminum hydroxide, reactions
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (production of cathode electroactive material for nonaq. lithium
        ion secondary battery)
REFERENCE COUNT:         6     THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS
                               RECORD. ALL CITATIONS AVAILABLE IN THE RE
FORMAT

L8   ANSWER 11 OF 19  CAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:        2000:67769  CAPLUS
DOCUMENT NUMBER:         132:110603
TITLE:                   Lithium secondary batteries using lithium manganate
                         spinel cathodes
INVENTOR(S):             Takahashi, Michio
PATENT ASSIGNEE(S):      NGK Insulators, Ltd., Japan
SOURCE:                  Jpn. Kokai Tokkyo Koho, 5 pp.
                         CODEN: JKXXAF
DOCUMENT TYPE:           Patent
LANGUAGE:                Japanese
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE         APPLICATION NO.        DATE
     ---------------      ----    --------    --------------------  --------
     JP 2000030707         A2     20000128    JP 1998-197855        19980713
     JP 3563268            B2     20040908
     JP 2004152777         A2     20040527    JP 2004-548           20040105
PRIORITY APPLN. INFO.:                        JP 1998-197855     A3 19980713

AB   The batteries contain cathode active materials of Li manganate
     spinels containing ≥1 elements selected from B, Bi, Mo, P, Cr, V, and
     W.  The materials may be obtained by firing mixts. of metal salts and/or
     oxides at 700-900° in an oxidizing atmospheric for 5-50 h.  Batteries
with
     low internal resistance and good charge-discharge cycle characteristics
     are obtained.
IT   Secondary batteries
        (button-type; secondary batteries using lithium manganate spinel
        cathodes with low elec. resistance)
IT   Secondary batteries
        (lithium; secondary batteries using lithium manganate spinel cathodes
        with low elec. resistance)
IT   Battery cathodes
        (secondary batteries using lithium manganate spinel cathodes with low
        elec. resistance)
IT   208394-05-2P, Lithium manganese molybdenum oxide   252568-43-7P, Lithium
     manganese tungsten oxide
     RL: DEV (Device component use); IMF (Industrial manufacture); PREP
     (Preparation); USES (Uses)
        (secondary batteries using lithium manganate spinel cathodes with low
        elec. resistance)

L8   ANSWER 12 OF 19  CAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         1999:412884  CAPLUS
DOCUMENT NUMBER:          131:76211
TITLE:                    Secondary lithium batteries and products using the
                          batteries
INVENTOR(S):              Kasai, Masahiro; Dozono, Toshinori
PATENT ASSIGNEE(S):       Hitachi, Ltd., Japan
SOURCE:                   Jpn. Kokai Tokkyo Koho, 6 pp.
                          CODEN: JKXXAF
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
```

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
JP 11176441	A2	19990702	JP 1997-344663		19971215
JP 2004259700	A2	20040916	JP 2004-94001		20040329
PRIORITY APPLN. INFO.:			JP 1997-344663	A3	19971215

AB The batteries comprise **cathode** active materials comprising spinel-structured Li1+xMn2-xO4 (0 < x < 1.33) and 0.01-10 mol% additives other than Li, Mn, and O (preferably B, P, Mg, As, Sb, Zr, Na, Be, Y, Si, Al, C, F, Bi, Pb, Ge, and/or Sn), that are optionally heat treated at 400-900°. Active materials of (A) Li1+xMyMn2-x-yO4 (0 < x < 1.33; 0 < y < 2; M ≥1 transition metals other than Mn) and 0.01-10 mol% additives other than Li, Mn, and O, (B) Li1+xMyMn2-x-y-zBzO4 (0 < x < 1.33; 0 < y + z < 2; M ≥1 transition metals other than Mn; B ≥1 elements other than Li, Mn, and M), or (C) (Li, A)1+xMyMn2-x-y-zBzO4 (0 < x < 1.33; 0 < y + z < 2; M ≥1 transition metals other than Mn; A = Mg, Zn, Fe, Cu, and/or Ni; B ≥1 elements other than Li, Mn, and M). Portable phones, portable videos camera, personal computers, domestic elec. appliances, elec. power storage systems, and elec. cars using the secondary lithium batteries as power sources are also claimed.

IT Electric vehicles
Electric vehicles
(automobiles; lithium manganese oxide containing additives as secondary battery **cathode** active materials)

IT Telephones
(cellular; lithium manganese oxide containing additives as secondary battery **cathode** active materials)

IT Electric appliances
(domestic; lithium manganese oxide containing additives as secondary battery **cathode** active materials)

IT Automobiles
Automobiles
Energy storage systems
(elec.; lithium manganese oxide containing additives as secondary battery

cathode active materials)

IT Battery cathodes
(lithium manganese oxide containing additives as secondary battery **cathode** active materials)

IT Secondary batteries
(lithium; lithium manganese oxide containing additives as secondary battery **cathode** active materials)

IT Computers
(microcomputers; lithium manganese oxide containing additives as secondary battery **cathode** active materials)

IT Video cameras
(portable; lithium manganese oxide containing additives as secondary battery **cathode** active materials)

IT 132001-60-6, Lithium manganese oxide (Li1-2.33Mn1.67-2O4) 229173-80-2, Cobalt lithium magnesium manganese oxide (Co0.1Li1.1Mg0.15Mn1.65O4)
RL: DEV (Device component use); USES (Uses)
(lithium manganese oxide containing additives as secondary battery **cathode** active materials)

IT 7429-90-5, Aluminum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses 7440-23-5, Sodium, uses 7440-31-5, Tin, uses 7440-36-0, Antimony, uses 7440-38-2, Arsenic, uses 7440-41-7, Beryllium, uses 7440-42-8, Boron, uses 7440-44-0, Carbon, uses 7440-56-4, Germanium, uses 7440-65-5, Yttrium, uses 7440-67-7, Zirconium, uses 7440-69-9, **Bismuth**, uses 7440-74-6, Indium, uses 7723-14-0, Phosphorus, uses 7782-41-4, Fluorine, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(**lithium manganese oxide** containing additives as secondary battery **cathode** active materials)

L8 ANSWER 13 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1998:714546 CAPLUS
DOCUMENT NUMBER: 130:27148
TITLE: Electrochemical properties of the Li/MnO2·Bi2O3 couple
AUTHOR(S): Atwater, Terrill B.; Salkind, Alvin J.
CORPORATE SOURCE: Rutgers, the State University of New Jersey, Piscataway, NJ, 08855-0909, USA

SOURCE: Proceedings of the Power Sources Conference (1998), 38th, 127-130
CODEN: PPOCFD
PUBLISHER: National Technical Information Service
DOCUMENT TYPE: Journal
LANGUAGE: English

AB **Bismuth oxide** modified beta **manganese** dioxide **cathode** material showed improved performance over β-MnO2 in primary **lithium** battery cells. An increased operating voltage for the **Li**/MnO2·(Bi2O3)0.06 electrochem. system compared to **Li**/β-MnO2 was observed Data also showed that the exchange c.d. for the **Li** /MnO2·(Bi2O3)0.06 electrochem. system was an order of magnitude higher than that of the **Li**/β-MnO2 system. The charge transfer coefficient and thermodn. properties of both systems were found to be similar. These results indicate a lower activation energy as a result of catalytic behavior of Bi2O3 in the **Li**/MnO2·(Bi2O3)0.06 cell reaction.

IT Battery cathodes
Enthalpy
Entropy
Free energy
(electrochem. properties of the Li/MnO2·Bi2O3 couple)

IT Primary batteries
(lithium; electrochem. properties of the Li/MnO2·Bi2O3 couple)

IT 1313-13-9, Manganese dioxide, uses 216490-69-6, **Bismuth manganese oxide** (Bi0.12Mn0.94O2.06)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(electrochem. properties of the **Li**/MnO2·Bi2O3 couple)

IT 1304-76-3, Bismuth oxide bi2o3, uses
RL: MOA (Modifier or additive use); USES (Uses)
(electrochem. properties of the Li/MnO2·Bi2O3 couple)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 14 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1998:151610 CAPLUS
DOCUMENT NUMBER: 128:156547

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TITLE:                    Thermodynamic and kinetic study of the Li/MnO2.Bi2O3
                          electrochemical couple
AUTHOR(S):                Atwater, Terrill B.; Salkind, Alvin J.
CORPORATE SOURCE:         Rutgers-State Univ. New Jersey, Piscataway, NJ,
                          08855-0909, USA
SOURCE:                   Journal of the Electrochemical Society (1998),
145(3),
                          L31-L33
                          CODEN: JESOAN; ISSN: 0013-4651
PUBLISHER:                Electrochemical Society
DOCUMENT TYPE:            Journal
LANGUAGE:                 English
AB   MnO2.(Bi2O3)0.06 cathode material showed improved performance
     over typical β-MnO2 in primary lithium battery prototype cells.
     Studies indicate that Bi2O3 surface-modified β-MnO2 material provided
     alternative catalytic discharge mechanisms, which lower the activation
     energy of the cell reaction.
IT   Primary batteries
        (lithium; thermodn. and kinetic study of the Li/MnO2.Bi2O3
electrochem.
        couple)
IT   Battery cathodes
     Enthalpy
     Entropy
     Free energy
        (thermodn. and kinetic study of the Li/MnO2.Bi2O3 electrochem. couple)
IT   1313-13-9, Manganese dioxide, uses
     RL: DEV (Device component use); PRP (Properties); USES (Uses)
        (thermodn. and kinetic study of the Li/MnO2.Bi2O3 electrochem. couple)
IT   1304-76-3, Bismuth oxide bi2o3, uses
     RL: MOA (Modifier or additive use); USES (Uses)
        (thermodn. and kinetic study of the Li/MnO2.Bi2O3 electrochem. couple)
REFERENCE COUNT:          4     THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS
                                RECORD. ALL CITATIONS AVAILABLE IN THE RE
FORMAT

L8   ANSWER 15 OF 19  CAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         1997:783320  CAPLUS
DOCUMENT NUMBER:          128:14882
TITLE:                    Thermodynamic and kinetic study of mixed metal oxide
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                              cathode material for lithium organic polymer
                              electrolyte electrochemical cells
AUTHOR(S):                    Atwater, Terrill Bradford
CORPORATE SOURCE:             Rutgers, State Univ., New Brunswick, NJ, USA
SOURCE:                       (1997) 271 pp.  Avail.: UMI, Order No. DA9800226
                              From: Diss. Abstr. Int., B 1998, 58(7), 3772
DOCUMENT TYPE:                Dissertation
LANGUAGE:                     English
AB   Unavailable
IT   Primary batteries
        (lithium; thermodn. and kinetic study of mixed metal oxide cathodes
for
        lithium organic polymer electrolyte batteries)
IT   Battery cathodes
        (thermodn. and kinetic study of mixed metal oxide cathodes for lithium
        organic polymer electrolyte batteries)
IT   7439-93-2, Lithium, uses
     RL: DEV (Device component use); USES (Uses)
        (thermodn. and kinetic study of mixed metal oxide cathodes for lithium
        organic polymer electrolyte batteries)
IT   136479-02-2, Bismuth manganese oxide
     RL: PRP (Properties); TEM (Technical or engineered material use); USES
     (Uses)
        (thermodn. and kinetic study of mixed metal oxide cathodes for
        lithium organic polymer electrolyte batteries)

L8   ANSWER 16 OF 19  CAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:             1997:433206  CAPLUS
DOCUMENT NUMBER:              127:97550
TITLE:                        Nonaqueous electrolyte lithium secondary battery with
                              mixed oxide cathode for long cycle life
INVENTOR(S):                  Uehara, Mayumi; Yamazaki, Mikiya; Noma, Toshiyuki;
                              Nishio, Koji
PATENT ASSIGNEE(S):           Sanyo Electric Co., Ltd., Japan
SOURCE:                       Jpn. Kokai Tokkyo Koho, 10 pp.
                              CODEN: JKXXAF
DOCUMENT TYPE:                Patent
LANGUAGE:                     Japanese
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:
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PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09147863	A2	19970606	JP 1995-329511	19951124
PRIORITY APPLN. INFO.:			JP 1995-329511	19951124

AB The battery **cathode** comprise a Li-transition metal mixed oxide and contain Li6CoO4. The reaction of the **cathode** with the electrolyte is prevented.

IT Battery cathodes
(nonaq.-electrolyte lithium battery with hexalithium cobaltate-containing mixed oxide **cathode** for long cycle life)

IT 7439-93-2D, Lithium, mixed oxides with transition metals, uses
12022-46-7, Iron lithium oxide (FeLiO2) 12057-17-9, Lithium manganese oxide (limn2o4) 101920-93-8, Cobalt lithium nickel oxide (co0.5lini0.5o2) 130732-38-6, Iron lithium manganese oxide (Fe0.12LiMe1.8O4) 130811-80-2, Lithium manganese nickel oxide (LiMn1.8Ni0.2O4) 130811-82-4, Cobalt lithium manganese oxide (Co0.2LiMn1.8O4) 130917-43-0, Chromium lithium manganese oxide (Cr0.2LiMn1.8O4) 130917-44-1, Lithium manganese vanadium oxide (LiMn1.8V0.2O4) 136479-37-3, Lithium magnesium manganese oxide (LiMg0.2Mn1.8O4) 143599-23-9, Lithium manganese zinc oxide (LiMn1.8Zn0.2O4) 143623-38-5, Lithium manganese tantalum oxide (LiMn1.8Ta0.2O4) 145896-60-2, Aluminum lithium manganese oxide (Al0.2LiMn1.8O4) 150424-09-2, Cobalt iron lithium oxide (Co0.1Fe0.9LiO2)
152013-71-3, Lithium manganese titanium oxide (LiMn1.8Ti0.2O4)
152060-87-2, Iron lithium manganese oxide (Fe0.9LiMn0.1O2) 160420-63-3, Cobalt lithium nickel borate oxide (Co0.4LiNi0.5(BO3)0.1O1.7)
177996-99-5, Aluminum iron lithium oxide (Al0.1Fe0.9LiO2) 177997-04-5, Gallium iron lithium oxide (Ga0.1Fe0.9LiO2) 185429-51-0, Iron lithium nickel oxide (Fe0.9LiNi0.1O2) 185429-52-1, Iron lithium vanadium oxide (Fe0.9LiV0.1O2) 191024-72-3, Cobalt lithium nickel sodium oxide (Co0.4LiNi0.5Na0.1O2) 191024-74-5, Cobalt lithium magnesium nickel oxide (Co0.4LiMg0.1Ni0.5O2) 191024-75-6, Aluminum cobalt lithium nickel oxide (Al0.1Co0.4LiNi0.5O2) 191024-76-7, Cobalt lithium nickel oxide silicate (Co0.4LiNi0.5O1.6(SiO4)0.1) 191024-77-8, Cobalt lithium nickel potassium

oxide (Co0.4LiNi0.5K0.102) 191024-78-9, Calcium cobalt lithium nickel
oxide (Ca0.1Co0.4LiNi0.502) 191024-79-0, Cobalt lithium nickel scandium
oxide (Co0.4LiNi0.5Sc0.102) 191024-80-3, Cobalt lithium nickel titanium
oxide (Co0.4LiNi0.5Ti0.102) 191024-81-4, Cobalt lithium nickel vanadium
oxide (Co0.4LiNi0.5V0.102) 191024-82-5, Chromium cobalt lithium nickel
oxide (Cr0.1Co0.4LiNi0.502) 191024-83-6, Cobalt lithium manganese
nickel
oxide (Co0.4LiMn0.1Ni0.502) 191024-84-7, Cobalt iron lithium nickel
oxide (Co0.4Fe0.1LiNi0.502) 191024-85-8, Cobalt copper lithium nickel
oxide (Co0.4Cu0.1LiNi0.502) 191024-86-9, Cobalt lithium nickel zinc
oxide (Co0.4LiNi0.5Zn0.102) 191024-87-0, Cobalt gallium lithium nickel
oxide (Co0.4Ga0.1LiNi0.502) 191024-89-2, Cobalt germanium lithium
nickel
oxide (Co0.4Ge0.1LiNi0.502) 191024-91-6, Cobalt lithium nickel
zirconium
oxide (Co0.4LiNi0.5Zr0.102) 191024-93-8, Cobalt lithium nickel niobium
oxide (Co0.4LiNi0.5Nb0.102) 191024-95-0, Cobalt lithium nickel
ruthenium
oxide (Co0.4LiNi0.5Ru0.102) 191024-97-2, Cobalt lithium nickel silver
oxide (Co0.4LiNi0.5Ag0.102) 191024-98-3, Cobalt lithium nickel tantalum
oxide (Co0.4LiNi0.5Ta0.102) 191024-99-4, Bismuth cobalt lithium nickel
oxide (Bi0.1Co0.4LiNi0.502) 191025-00-0, Cobalt indium lithium nickel
oxide (Co0.4In0.1LiNi0.502) 191025-01-1, Cobalt lithium molybdenum
nickel oxide (Co0.4LiMo0.1Ni0.502) 191025-02-2, Cobalt lithium nickel
tungsten oxide (Co0.4LiNi0.5W0.102) 191025-03-3, Iron lithium borate
oxide (Fe0.9Li(B03)0.101.7) 191025-04-4, Iron lithium sodium oxide
(Fe0.9LiNa0.102) 191025-05-5, Iron lithium magnesium oxide
(Fe0.9LiMg0.102) 191025-06-6, Iron lithium oxide silicate
(Fe0.9Li01.6(Si04)0.1) 191025-07-7, Iron lithium potassium oxide
(Fe0.9LiK0.102) 191025-08-8, Calcium iron lithium oxide
(Ca0.1Fe0.9Li02)
191025-09-9, Iron lithium scandium oxide (Fe0.9LiSc0.102) 191025-10-2,
Iron lithium titanium oxide (Fe0.9LiTi0.102) 191025-11-3, Chromium iron
lithium oxide (Cr0.1Fe0.9Li02) 191025-12-4, Copper iron lithium oxide
(Cu0.1Fe0.9Li02) 191025-13-5, Iron lithium zinc oxide (Fe0.9LiZn0.102)
191025-14-6, Germanium iron lithium oxide (Ge0.1Fe0.9Li02) 191025-15-7,
Iron lithium zirconium oxide (Fe0.9LiZr0.102) 191025-16-8, Iron lithium
niobium oxide (Fe0.9LiNb0.102) 191025-17-9, Iron lithium ruthenium
oxide
(Fe0.9LiRu0.102) 191025-18-0, Iron lithium silver oxide
(Fe0.9LiAg0.102)

191025-19-1, Iron lithium tantalum oxide (Fe0.9LiTa0.102) 191025-20-4, Bismuth iron lithium oxide (Bi0.1Fe0.9Li02) 191025-21-5, Indium iron lithium oxide (In0.1Fe0.9Li02) 191025-22-6, Iron lithium molybdenum oxide (Fe0.9LiMo0.102) 191025-23-7, Iron lithium tungsten oxide (Fe0.9LiW0.102) 191025-24-8, Lithium manganese borate oxide (LiMn1.8(B03)0.203.4) 191025-25-9, Lithium manganese sodium oxide (LiMn1.8Na0.204) 191025-26-0, Lithium manganese oxide silicate (LiMn1.803.2(Si04)0.2) 191025-28-2, Lithium manganese potassium oxide (LiMn1.8K0.204) 191025-29-3, Calcium lithium manganese oxide (Ca0.2LiMn1.804) 191025-30-6, Lithium manganese scandium oxide (LiMn1.8Sc0.204) 191025-31-7, Copper lithium manganese oxide (Cu0.2LiMn1.804) 191025-32-8, Gallium lithium manganese oxide (Ga0.2LiMn1.804) 191025-33-9, Germanium lithium manganese oxide (Ge0.2LiMn1.804) 191025-34-0, Lithium manganese zirconium oxide (LiMn1.8Zr0.204) 191025-35-1, Lithium manganese niobium oxide (LiMn1.8Nb0.204) 191025-36-2, Lithium manganese ruthenium oxide (LiMn1.8Ru0.204) 191025-37-3, Lithium manganese silver oxide (LiMn1.8Ag0.204) 191025-38-4, **Bismuth lithium manganese oxide** (Bi0.2LiMn1.804) 191025-39-5, Indium lithium manganese oxide (In0.2LiMn1.804) 191025-40-8, Lithium manganese molybdenum oxide (LiMn1.8Mo0.204) 191025-41-9, Lithium manganese tungsten oxide (LiMn1.8W0.204)

too large

RL: DEV (Device component use); USES (Uses)
(**cathode** active mass; nonaq.-electrolyte **lithium** battery with hexalithium cobaltate-containing mixed oxide **cathode** for long cycle life)

IT 51912-32-4, Cobalt lithium oxide (CoLi604)
RL: MOA (Modifier or additive use); USES (Uses)
(nonaq. electrolyte lithium battery with hexalithium cobaltate-containing mixed oxide **cathode** for long cycle life)

L8 ANSWER 17 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	1997:14570 CAPLUS
DOCUMENT NUMBER:	126:62650
TITLE:	Secondary nonaqueous-electrolyte lithium battery and oxygen-deficient lithium-manganese oxide spinel for its **cathode** active material
INVENTOR(S):	Kemmler-Sack, Sibylle; Endres, Peter; Praas, Hans-Walter

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PATENT ASSIGNEE(S):      Varta Batterie Ag, Germany
SOURCE:                  Ger. Offen., 12 pp.
                         CODEN: GWXXBX
DOCUMENT TYPE:           Patent
LANGUAGE:                German
FAMILY ACC. NUM. COUNT:  1
PATENT INFORMATION:

    PATENT NO.          KIND  DATE        APPLICATION NO.        DATE
    ---------------     ----  --------    --------------------   --------
    DE 19515630          A1   19961031    DE 1995-19515630       19950428
    CA 2218315           AA   19961031    CA 1996-2218315        19960416
    WO 9634423           A1   19961031    WO 1996-EP1592         19960416
        W:  BR, CA, CN, CZ, JP, KR, MX, RU, SG, US
        RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,
SE
    EP 827636            A1   19980311    EP 1996-914924         19960416
    EP 827636            B1   19981223
        R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, NL, SE, PT, IE, FI
    CN 1183171           A    19980527    CN 1996-193578         19960416
    CN 1111920           B    20030618
    BR 9608001           A    19990105    BR 1996-8001           19960416
    AT 175056            E    19990115    AT 1996-914924         19960416
    JP 11504154          T2   19990406    JP 1996-532137         19960416
    CZ 287338            B6   20001011    CZ 1997-3403           19960416
    US 6183910           B1   20010206    US 1997-957111         19971024
    HK 1016750           A1   20040319    HK 1998-111695         19981102
PRIORITY APPLN. INFO.:                    DE 1995-19515630    A  19950428

                                          WO 1996-EP1592      W  19960416

AB   The spinel is Li1+xMn2-xO4-δ where x ≤0.33 and 0.01
     ≤δ ≤0.5 with exception for all x = 0.5δ + 0.01.
     A portion of Li can be replaced by an addnl. 1-valent or multivalent
     cation selected from Co, Mg, Zn, Ni, Ca, Bi, Ti, V, Rh, and Cu.  The
     spinel is formed by heating a mixture of LiOH.H2O or Li2CO3 and a Mn
oxide
     at 350-900°, subsequent heating at 500-850, and cooling.  The
     reaction product can be treated at 600-850° in an Ar-H atmospheric and
     cooled to .apprx.20° in Ar-H atmospheric, and then heated at
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500-850° and cooled in Ar-O atmospheric The spinel composition is also defined
in a phase diagram with MnO, MnO2, and Li2MnO3 end points.

IT Battery cathodes
(oxygen-deficient lithium-manganese oxide spinel for)

IT 7439-95-4, Magnesium, uses 7440-02-0, Nickel, uses 7440-16-6, Rhodium,
uses 7440-32-6, Titanium, uses 7440-48-4, Cobalt, uses 7440-50-8,
Copper, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses
7440-69-9, **Bismuth**, uses 7440-70-2, Calcium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(oxygen-deficient **lithium-manganese oxide**
spinel for **cathode** active material containing)

IT 184905-11-1P, Lithium manganese oxide (Li1.04Mn1.96O3.94) 184905-12-2P,
Lithium manganese oxide (Li1.1Mn1.9O3.9)
RL: PEP (Physical, engineering or chemical process); SPN (Synthetic
preparation); PREP (Preparation); PROC (Process)
(secondary nonaq.-electrolyte lithium battery its **cathode**
active material of)

L8 ANSWER 18 OF 19 CAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER:	1993:521215 CAPLUS
DOCUMENT NUMBER:	119:121215
TITLE:	Electrochemical and structural studies of the composite manganese dioxide **cathode** doped with metal oxides
AUTHOR(S):	Li, Shengxian; Shi, Zhong; Yang, Changchun; Yang, Hanxi
CORPORATE SOURCE:	Dep. Chem., Wuhan Univ., Wuhan, 430072, Peop. Rep. China
SOURCE:	Journal of Power Sources (1993), 44(1-3), 533-7 CODEN: JPSODZ; ISSN: 0378-7753
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB The composite MnO2 made from heat-treated LiOH.MnO2 (CDMO) was doped with various metal oxides and characterized by x-ray diffraction and DTA. Doped CDMO kept the crystal structure of CDMO and had a reduced Li2MnO3 content. Cycling tests showed that the doped CDMO had superior cycleability and improved discharge capacity in comparison with undoped CDMO. Bi2O3-doped composite MnO2 **cathode** had the best recharge

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    rate capacity.
IT  Cathodes
      (battery, manganese dioxide, doped composite, electrochem. and
      structural properties of)
IT  1304-76-3, Bismuth oxide (Bi2O3), uses   1309-60-0, Lead dioxide
    1314-62-1, Vanadium oxide (V2O5), uses   7646-79-9, Cobalt chloride
    (CoCl2), uses   13463-67-7, Titania, uses   18282-10-5, Tin dioxide
    RL: USES (Uses)
      (cathodes from composite manganese dioxide doped with, electrochem.
and
      structural properties of, for batteries)
IT  1313-13-9, Manganese dioxide, uses
    RL: USES (Uses)
      (cathodes from doped composite, electrochem. and structural properties
      of, for batteries)
IT  12163-00-7, Lithium manganese oxide (Li2MnO3)
    RL: USES (Uses)
      (cathodes from doped manganese dioxide and, electrochem. and
structural
      properties of, for batteries)

L8  ANSWER 19 OF 19  CAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:       1992:452380  CAPLUS
DOCUMENT NUMBER:        117:52380
TITLE:                  Secondary nonaqueous batteries
INVENTOR(S):            Miyazaki, Tadaaki; Ogino, Takao; Wada, Hiroaki;
                        Masuda, Yoshitomo
PATENT ASSIGNEE(S):     Bridgestone Corp., Japan
SOURCE:                 Jpn. Kokai Tokkyo Koho, 5 pp.
                        CODEN: JKXXAF
DOCUMENT TYPE:          Patent
LANGUAGE:               Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

    PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
    ---------------     ----   --------   --------------------   --------
    JP 03233859          A2    19911017   JP 1990-26978          19900206
PRIORITY APPLN. INFO.:                    JP 1990-26978          19900206
```

AB Secondary Li batteries use cathodes containing powdered alloys containing ≥40 mol% of Sb and/or Bi. These batteries have improved overcharging tolerance and good charge-discharge performance.

IT Cathodes
(battery, metal oxide, bismuth- and/or antimony-containing alloys in, for overcharging performance)

IT 7440-36-0, Antimony, uses 7440-69-9, Bismuth, uses 138698-43-8
RL: USES (Uses)
(**cathode** containing, metal oxide, for secondary lithium batteries)

IT 39457-42-6, **Lithium manganese oxide**
138821-07-5, Lithium vanadium oxide (Li1.04V3O8)
RL: USES (Uses)
(**cathode**, containing **bismuth** alloy powder, for secondary **lithium** batteries)

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Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	190	"Li.sub.0.5"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:19
L2	8998	"MnO.sub.2"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:20
L3	4108	"Bi.sub.2" adj "O.sub.3"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:20
L4	0	1 adj2 2 adj 3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:20
L5	0	1 near3 2 near3 3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:21
L6	13463	bismuth near5 oxide	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:22
L7	435005	cathode or positive adj electrode	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:21
L8	297	6 same 7	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:21
L9	10491	bismuth adj5 oxide	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:22

L10	241	7 same 9	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:24
L11	14	9 near5 manganese near5 lithium	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:29
L12	129	bismuth near5 manganese near5 lithium	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:29
L13	32	12 near7 oxide	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:30
L14	1	13 same 7	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:31
L15	2	"63121250"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:34
L16	16478	Li"."sub"."$	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:50
L17	33	16 adj5 3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:35
L18	3	17 same 2	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:46
L19	3	17 same 7	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:47

L20	6762	Mn"."sub"."$	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 11:44
L21	0	16 adj4 20 adj4 "O.sub.2" adj4 3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:51
L22	0	16 near4 20 near4 "O.sub.2" near4 3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:52
L23	2	16 near4 20 near4 (O"."sub"."$4) near4 3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 10:54
L24	0	("6489060").URPN.	USPAT	OR	OFF	2005/03/17 10:55
L25	2	("2864713").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/03/17 10:55
L26	14	("4225657" | "5147738" | "5424145" | "5478673" | "5705291" | "5759720" | "5882218" | "5882821" | "5891592" | "5964902" | "6074777" | "6090505" | "6183718" | "6248477").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/03/17 10:55
L27	0	("6489060").URPN.	USPAT	OR	OFF	2005/03/17 11:02
L28	123148	bismuth or bi	USPAT	OR	OFF	2005/03/17 11:03
L29	3	26 and 28	USPAT	OR	OFF	2005/03/17 11:04
L30	381	429/231.1.ccls.	USPAT	OR	OFF	2005/03/17 11:05
L31	946	429/224.ccls.	USPAT	OR	OFF	2005/03/17 11:40
L32	590	429/218.1.ccls.	USPAT	OR	OFF	2005/03/17 11:40
L33	1604	30 or 31 or 32	USPAT	OR	OFF	2005/03/17 11:40
L34	50	33 and 3	USPAT	OR	OFF	2005/03/17 11:41
L35	91	(6 or 3) same 16 same (20 or 2)	USPAT	OR	OFF	2005/03/17 11:42
L36	4	35 and 34	USPAT	OR	OFF	2005/03/17 11:42
L37	10435	Bi"."sub"."$	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 11:45

L38	283913	O"."sub"."$5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 11:45
L39	284088	O"."sub"."$6	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 11:45
L40	284597	O"."sub"."$7	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 11:46
L41	1	16 adj5 (20 near5 37) adj5 40	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/17 11:48